

**Kingston Flooding Task Force
Steelhouse, Kingston, NY
February 12, 2013 * 3-6 pm**

Meeting Summary

Next Meeting

2-6 pm, March 12, 2013 at Riverview Church, 240 Catherine St., Kingston, NY

Action Items

- Task Force members – Review asset list and provide corrections or additions to Sacha Spector by March 1 (sspector@scenichudson.org)
- Task Force members – Review meeting 1 & 2 summaries and provide comments to Ona Ferguson by March 5 (oferguson@cbuilding.org)
- DOS Risk Assessment Tool (CRRP), Subcommittee – Complete DOS tool for complete asset list
- Planning team – Develop meeting 3 agenda
- Planning team – Check in with absent Task Force members

Welcome and Introductions

On February 12, 2013, members of the Kingston Flooding Task Force met at the Steel House for their second Flooding Task Force meeting. The 38 meeting participants and a list of handouts are listed in the appendix. A full set of meeting presentations and the compiled map showing the work by meeting participants can be found at Kingstoncac.org.

Participants introduced themselves and spoke briefly about why they accepted the mayor's invitation to join the Task Force. Attendees represented a diverse group of perspectives, from business owners and residents to architects and city officials. They expressed their interest in better understanding flooding and sea-level rise in Kingston, participating in future planning for a more sustainable waterfront, understanding why flooding is happening, helping to mitigate some of the impacts of climate change, addressing the flooding problem, helping the community think long-term, and generally both learning and to being part of the solution.

Results of Task Force Kick-Off Meeting and Participatory Mapping

Kristin Marcell (Hudson River Estuary Program/Cornell WRI) shared some of the results from the Task Force's kick-off meeting on December 6th, 2012. Please see project website and meeting summary for more details. At that meeting, participants identified shared criteria or concepts the Flooding Task Force should consider to prioritize community assets, including:

- Consider whether new development opportunities should be limited in high risk areas
- Prioritize critical infrastructure (like wastewater treatment plant), assets that affect health and safety and water-dependent businesses

- Evaluate costs and benefits of assets, consider in particular the economic benefits of the waterfront and what makes these benefits possible (i.e. what draws people to the Kingston waterfront)
- Consider the cultural and historical value of assets on the waterfront
- Retain buildings that are already resilient
- Look for models from other areas of the country and world
- Aim to conserve natural protective features or use them as a flooding buffer
- Consider effects of adaptation decisions on vulnerable populations and natural systems

Participants at the December meeting also shared their visions for a flood-resilient waterfront in Kingston, which Kristin reviewed. See page 4-5 of the Meeting 1 summary for details.

Sacha Spector (Scenic Hudson) distributed the compiled list of waterfront assets identified by attendees at the kick-off meeting. He noted the dense, rich universe of assets that emerged from the collective wisdom and experience of the group and how together they essentially identified the flood risk zone on the waterfront map. Sacha asked Task Force members to review this list and send him any corrections or additions. A map with the assets and risk zones identified was also distributed.

Introduction of Major Project Components, Specifically Two Risk Assessment Tools

Kristin introduced the overall plan for the Task Force's work between this meeting and the end of the spring. The primary tasks in the work plan are:

1. Identify assets at risk (now and future) from flooding using community-input
2. Select sea level rise levels and storm hazard frequencies for risk assessment
3. Assess risk to local assets using two tools
4. Prioritize assets to address with adaptation/preparedness strategies
5. Evaluate and select adaptation strategies the Task Force would like to recommend
6. Recommend selected strategies or approaches to the appropriate bodies and raise public awareness of Task Force outcomes
7. [And, after the Task Force's work is complete] Implement adaptation strategies

The purpose of the process in general is to empower the task force to make their own planning recommendations. Kristin introduced the two assessment tools that will be used to assist the Task Force in prioritizing critical assets (step 3 in the list above). The Kingston Task Force is the pilot of this type of process, so by comparing both tools we will hopefully learn a lot for Kingston and also see what information each tool can provide to other communities.

Both risk assessment tools use the following equation to assess risk to an asset:

Risk = Hazard x Exposure x Vulnerability

In the case of this initiative,

- **Hazard** represents water level and storm probability.
- **Exposure** represents whether the asset is protected or exposed by the characteristics of the surrounding landscape.
- **Vulnerability** represents the ability of the asset to recover from a flood event.

The first tool, the Coastal Reconstruction and Resilience Planning (CRRP), is being developed by the NYS Department of State (DOS) and piloted here in Kingston. The second is the Coastal Adaptation to Sea Level Rise Tool (COAST), which will be developed and implemented by Catalysis consulting firm. The CRRP tool uses a scoring sheet to quantify relative risk for each asset, whereas COAST looks at tax parcel information to create a visualization of financial risk. Each tool requires the user to select a combination of water levels, flood events, and time horizons that they would like to see analyzed.

Participants discussed the challenge of dealing with stormwater management and overland flooding in addition to coastal flooding from the Hudson or Rondout, and asked whether this project will look at those elements as well. Project team members said that this Task Force is focused particularly on sea level rise, noting that flooding from the watershed can indeed exacerbate the challenges people in Kingston face. Julie Noble (Kingston CAC) said Kingston will be producing a Rondout Creek watershed management plan that will look at the whole watershed and that the leaders of the effort are currently seeking members to assist with that.¹

Task Force Selection of Sea Level Rise and Flooding Depths, Time Horizons and Severity

Mark Lowery (NYSDEC Office of Climate Change) gave background on current climate change predictions. He used a variety of graphs to show the historic effects on global and local sea level. The last glacial retreat began 21,000 years ago. As a result, global sea level rose 120 meters (394 feet) before stabilizing 2-3000 years ago. Sea level rise globally only began changing again in 19th century. In the 20th century, the global average sea level rose 1.8 millimeters (0.07 inch) per year. More recent data shows a 3.3 millimeter (0.13 inch) per year rise since 1993, significantly faster than the previous half century. There are three primary factors that affect global sea-level rise:

1. Water expands in volume as it becomes warmer, a process known as thermosteric expansion. Increasing average temperature, sometimes referred to as “global warming,” accounts for 50-60% of recent sea level rise.

¹ The City of Kingston has engaged Milone and McBroom to conduct an engineering study to look to mitigate flooding and design a stormwater system to support redevelopment along East Strand. The study is funded by the NYS Dept. of State. Representatives of this firm have attended both meetings.

2. When land-based ice melts, it flows into the ocean, increasing global sea level. This process occurs as warmer air temperatures melt glaciers on Greenland, Antarctica and elsewhere, and is expected to account for a greater proportion of future sea-level rise.
3. Global sea level interacts with underground water, soil moisture, and other forms of terrestrial (land based) water storage. These processes are more complex and not as well understood.

Sea level rise does not occur uniformly around the globe. Relative sea level rise is the local expression of global sea level rise, and is affected by three primary factors:

1. Land height rises and falls in response to retreating glaciers (this is known as glacial isostatic readjustment). This process can counteract or exacerbate the effects of sea-level rise. For example, land north of Kingston is rebounding from the weight of glaciers that retreated thousands of years ago and will therefore experience reduced sea level rise. Land south of Kingston is subsiding and will therefore experience even greater sea level rise. Kingston is the fulcrum, so for the purposes of our models we will lump it with the land north and use lower levels of sea level rise (SLR).
2. Sea floors and river bottoms have unique shapes and contours known as bathymetry. Bathymetry determines underwater depth and therefore affects local water levels.
3. Local water levels can be higher or lower than global sea level based on changes to water surface elevation. For example, the Gulf Stream holds water at a higher level, pulling water away from the eastern U.S. coast. A recent report provided evidence that as ocean water has gotten warmer, the Gulf Stream has weakened, allowing water to “flow” back toward the coast and causing greater levels of sea level rise from Cape Hatteras, NC to Boston, MA.

Mark Lowery presented the sea-level rise projections from the ClimAID “Responding to Climate Change in New York State” report. That report used two scenarios, with and without rapid ice melt, to project sea-level rise in the 2020s, 2050s, 2080s and at 2100, compared to 1971-2000 baseline (see table below). These projections are consistent with ice core data that shows the historic relationship between atmospheric composition and global sea level. Mark said many consider the rapid ice scenario to be more realistic given recent observations of melting glaciers.

Sea Level Rise Projections in inches for the Mid-Hudson Valley & Capital Region

	Baseline (1971 – 2000)	2020s	2050s	2080s	2100
Sea Level Rise (inches)	NA	1 to 4	5 to 9	8 to 18	11 to 26
Seal Level Rise Rapid Ice Melt (inches)	NA	4 to 9	17 to 26	37 to 50	52 to 68

Given this information, the planning team proposed the following sea level rise levels for the Task Force’s vulnerability assessment:

Proposed Sea-Level Rise Assumptions

Scenario	Year	2050	2100
Low		17 inches	36 inches
High		26 inches	68 inches

They also proposed the Task Force use 2050 and 2100 as time horizons, based on the planned longevity of infrastructure (70 years), and 1% and 10% storm frequencies. FEMA designates a 10% (often called “10-year”) storm in the Kingston waterfront as a six foot flood and a 1% (“100-yr”) storm as an eight foot flood. Mark said water levels during the peak of Hurricane Sandy, which caused a storm surge and occurred during a full moon (higher high tide), were a foot greater than the area’s 1% flood.

Task Force members then discussed and decided on these three items for their analysis:

A. Time Horizon: The Task Force will officially use 2060 and 2100 as their time horizons in analyzing waterfront risks.

- a. Discussion: Members discussed the proposed time horizons of 2050 and 2100. They raised concerns about looking too far into the future where uncertainty is even greater and the challenge of dissuading people from developing in the Hudson Valley. For example, 2100 predicted sea levels are as much as 40” higher than 2080 predictions. Others felt that the Task Force should take the most aggressive, long-term perspective as there are many global examples of designing buildings to last for 200 years. One member suggested that 2050 is too soon and that 2060 would work better with the typical mortgage periods of 30 years. Another member pointed out the need for consistency across all New York State communities to look at and plan for the same time horizons and indicated a desire for the State to determine what time horizon each community should plan for so there would be consistency as communities do this work. Participants discussed their desire to analyze the worst case scenarios (which some called the most realistic scenarios), rather than knowingly underestimating what the community might be facing. They agreed with planning team members that the term “conservative” is confusing as it can be interpreted in several ways and recommended using “best case” and “worst case” to describe different futures. Task Force members selected 2060 in place of 2050 for the earlier time horizon. They then decided that 2080 would be too close to 2060 as a later time horizon and voted unanimously to use 2100 as their second date for analysis.

B. Sea Level Rise Levels: See table above (note that the height of SLR will be adjusted to be at the 2060 period rather than what is indicated for 2050).

- a. Discussion: Task Force members discussed the sea-level rise levels they would use to inform the base water levels in their assessments and accepted those proposed by the planning team (see table above).

C. Storm Severity: 1% and 10% storm.

- a. Members discussed what storm flooding depth they would choose to work with. They discussed Sandy, which was nine feet of flood, slightly greater than the 1% flood of eight feet. Everyone agreed to use the 1% and 10% flood levels, as the planning team proposed.

NYS DOS Risk Assessment Process

Barry Pendergrass (NYS Department of State) introduced the DOS risk assessment tool, Coastal Reconstruction and Resilience Planning (CRRP), which a subgroup of the Task Force will complete between this meeting and the March meeting. Barry has been designing this tool, which has gained attention since Hurricane Sandy, as a generic framework for NY communities to assess these types of risks. This tool will be piloted here, and the Task Force's experience with using the tool will lead to revisions of the tool for future use in other places. The tool uses quantitative methods to address social-cultural, economic and environment issues across sectors. The CRRP tool is a scoring sheet that allows communities to evaluate each asset in a simplified way, relative to each other. Scenic Hudson is creating risk zone maps for the City of Kingston waterfront that categorize moderate, high and extreme risk areas that will assist the scoring process. The following shows how each variable is estimated and scored using this tool:

Risk Estimating Process for each Asset			
Risk = Hazard x Exposure x Vulnerability			
HAZARD SCORE	5	Very likely	>90% chance
The likelihood of an event	4	Likely	66-90%
occurring within a specific	3	Possible	33-66%
planning timeframe	2	Unlikely	10-33%
	1	Very unlikely	1-10%
EXPOSURE SCORE	4	Very high	(scores are weighted)
Influence of local	3	High	
topographic and geomorphic	2	Moderate	
features on the severity of	1	Low	
damages			
VULNERABILITY SCORE	5	Major	(permanent loss)
Level of impact to critical	4	Significant	
resources	3	Moderate	(days out of service)
	2	Minor	
	1	Insignificant	(short term loss)

Task Force members will use this system to score each identified asset on a risk scale of one to 100. The results will provide first the Task Force, then perhaps the larger community, a sense of relative risk across all assets, allowing them to prioritize their planning efforts on those things most at risk. Overall, the assessment tools offer methods, data and information to empower the community to make its own decisions on how to plan for their waterfront. This tool doesn't provide a way for people to determine scale or meaningfulness of an impact, but rather the risk to one asset relative to another in the same analysis. Communities can then use that information to make decisions based on their unique qualities and values.

Barry led the group through an example, scoring Feeney's Shipyard. The Task Force used their local knowledge to provide scores for the hazard, exposure and vulnerability of Feeney's. Ultimately, Feeney's Shipyard received a total risk score of 31 out of 100. Barry explained its relatively low risk number is attributed to the shipyard's ability to recover quickly from flooding, thanks to preparations they make prior to storms.

In general discussion about this CRRP tool, Task Force members expressed concerns about the level of detail in the assessments, how much they considered local characteristics, rain and surface water inputs, and other factors in flood predictions. One member brought up the impact of certain storms to flood the waterfront with dirty, muddy water from onshore versus cleaner river water from a storm surge.

Wrap Up & Next Steps

Kristin Marcell's planned presentation on adaptation and preparedness strategies was put off for the next meeting due to time constraints. Facilitator Ona Ferguson (Consensus Building Institute) wrapped up the meeting with a discussion of next steps. Several Task Force members offered to work with DOS and Scenic Hudson on the risk assessment scoring tool (CRRP) in a two hour work session before the March 12 meeting: Jennifer Schwartz Berky, Susan Spencer Crowe, Patrick McDonough, Sue Cahill, Julie Noble and Gregg Swanzey. Doris Edwards offered her church for the March meeting location. Task Force members were asked to complete a brief evaluation of this meeting.

Appendix: Meeting Participants and Handouts

Task Force Members

Deborah Brown, City of Kingston - Common Council Ward 9
Doris Edwards, Riverview Baptist Church
Steve Finkle, AVR
Huntley Gill, Guardia Architects
Kyla Haber, City of Kingston - Planning
Tom Hoffay, City of Kingston - Common Council Ward 2
Joseph Hurwitz, Sailors Cove
Patrick McDonough, Hudson River Maritime Museum
Kevin McEvoy, Kingston Land Trust
Mike Oats, Hudson River Ventures
Lisa Pugliese, Steelhouse
Steve Schabot, City of Kingston - Parks and Rec Board
Jennifer Schwartz-Berky
Allan Shope, Clearwater
Susan Spencer Crowe
Sarah Hrichi, Ship to Shore

Project Team Members

Jeff Anzevino, Scenic Hudson
Betsy Blair, NYSDEC HRNERR
Sue Cahill, City of Kingston - Planning
Fran Dunwell, NYSDEC Hudson River Estuary Program
Ona Ferguson, Consensus Building Institute
Emilie Hauser, NYSDEC HRNERR
Mark Lowery, NYSDEC Office of Climate Change
Kristin Marcell, NYSDEC HREP Cornell
Libby Murphy, NYSDEC HREP Cornell
Julie Noble, City of Kingston - CAC
Barry Pendergrass, NYS Department of State
Sacha Spector, Scenic Hudson
Gregg Swanzey, City of Kingston - Economic Development
Christina Tobitsch, NYSDEC HRNERR and SCA

Others Present

Tania Barricklo, Kingston Daily Freeman
Diane Dintruff, Esopus Environmental Board
Nadine Ferraro, Steel House
Amanda Lavalley, Ulster County Department of the Environment
Jim Murac, Milone and MacBroom
Irene Nielson, EPA Region 2
David Railsback, ARCADIS
Steve Rosenberg, Scenic Hudson

Handouts: List of assets, map showing risk zones and assets, meeting 2 agenda, meeting evaluation, December meeting summary, list of resources